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	Filing Date	November 20, 2001
	First Named Inventor	William C. Black
	Examiner Name	Linda Wong
	Art Unit	2611
	Patent No.	
Attorney Docket Number		X-933 US

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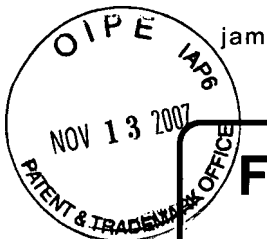
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Application / Conf. No.	09/989,937 / 1537
Filing Date	November 20, 2001
First Named Inventor	William C. Black
Examiner Name	Linda Wong
Art Unit	2611
Attorney Docket No.	X-933 US

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FEE CALCULATION

1. BASIC FILING FEE

Large Entity

Fee Code	Fee (\$)	Fee Description	Fee
1001	770	Utility filing fee	
1002	330	Design filing fee	
1003	510	Plant filing fee	
1004	790	Reissue filing fee	
105	160	Provisional filing fee	

SUBTOTAL (1)

(\$)

2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE

Total Claims	-20** =	Extra	X	Fee from below	=	Fee Paid
Indep. Claims	- 3** =		X		=	
Multiple Dependent Claims			X		=	

**or number previously paid, if greater; For Reissues, see below

Large Entity

Fee Code	Fee (\$)	Fee Description
1202	18	Claims in excess of 20
1201	86	Independent claims in excess of 3
1203	290	Multiple dependent claim, if not paid
1204	86	**Reissue independent claims over original patent
1205	18	**Reissue claims in excess of 20 and over original patent

SUBTOTAL (2)

(\$)

FEE CALCULATION (continued)

3. ADDITIONAL FEES

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Code	Fee (\$)	Fee Description	Fee Paid
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1804	920*	Requesting publication of SIR prior to Examiner action	
1805	1,840*	Requesting publication of SIR after Examiner action	
1251	120	Extension for reply within first month	
1252	460	Extension for reply within second month	
1253	1050	Extension for reply within third month	
1254	1,640	Extension for reply within fourth month	
1255	2,230	Extension for reply within fifth month	
1401	510	Notice of Appeal	
1402	510	Filing a brief in support of an appeal	\$510
1403	1030	Request for oral hearing	
1451	1,510	Petition to institute a public use proceeding	
1452	510	Petition to revive - unavoidable	
1453	1,540	Petition to revive - unintentional	
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1807	50	Petitions related to provisional applications	
1806	180	Submission of Information Disclosure Stmt	
8021	40	Recording each patent assignment per property (times number of properties)	
1809	810	Filing a submission after final rejection (37 CFR 1.129(a))	
1810	810	For each additional invention to be examined (37 CFR 1.129(b))	
1801	810	Request for Continued Examination (RCE)	

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SUBTOTAL (3)

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SUBMITTED BY

Complete (if applicable)

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X-933 US
09/989,937

PATENT
Conf. No.: 1537

IN THE UNITED STATES PATENT OFFICE

Applicant: William C. Black
Assignee: Xilinx, Inc.
Title: Device and Method for Compensation of Transmission Line Distortion

Serial No.:	09/989,937	File Date:	November 20, 2001
Examiner:	Linda Wong	Art Unit:	2611
Docket No.:	X-933 US	Conf. No.:	1537

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APPEAL BRIEF

This Appeal Brief is submitted pursuant to 37 C.F.R. § 41.37 for the above-referenced patent application consistent with the Notice of Appeal filed on October 18, 2007.

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I. REAL PARTY IN INTEREST

The real party in interest is the assignee, Xilinx, Inc.

II. RELATED APPEALS AND INTERFERENCES

Appellant is unaware of any related appeals, interferences or judicial proceedings that would have a bearing on the Board's decision in the instant appeal.

III. STATUS OF CLAIMS

Claims 1-5, 9-14, and 18-22 are pending and are presented for appeal. Claims 6-8, 15-17, and 23-29 have been cancelled without prejudice or disclaimer. Each of the pending claims have been finally rejected by the Examiner's action dated June 1, 2007, from which Appellant initiates this appeal.

The pending Claims 1-5, 9-14, and 18-22 under appeal may be found in the attached Claims Appendix.

IV. STATUS OF AMENDMENTS

A response to the final rejection dated June 1, 2007 was filed on July 26, 2007. However, no amendments were made to the claims.

V. SUMMARY OF CLAIMED SUBJECT MATTER

The independent claims involved in the appeal include claims 1, 10, and 18. As required by 37 C.F.R. § 41.37(c)(1)(v), a concise explanation of the subject matter defined in each of the independent claims involved in the appeal is provided herein. Appellant notes that representative subject matter is identified for each of these claims; however, the abundance of supporting subject matter in the application prohibits identifying all textual and diagrammatic references to each claimed recitation. Appellant thus submits that other application subject matter, which supports the claims but is not specifically identified below, may be found elsewhere in the application.

The present invention is generally directed to various embodiments of apparatus for the compensation of transmission line distortion.

One example embodiment is manifested in Claim 1, which is directed to an output interface, (e.g., FIG. 3 ref #127, ref #137, paragraph [0026]). The output interface of Claim 1 includes an amplifier, (e.g., FIG. 4 ref #250, paragraph [0027]; FIG. 5 ref #250, paragraph [0028]; FIG. 6 ref # 250, paragraph [0029]), having an output impedance, (e.g., FIG. 4 ref #260, paragraph [0027]; FIG. 6 ref #261, paragraph [0029]; and an input continuously coupled to receive an input signal, (e.g., FIG. 5 ref #420, paragraph [0028]). The amplifier sources a transmission line, (e.g., FIG. 3 ref #140, paragraph [0026]; FIG. 5 ref #410, paragraph [0028]).

The output interface of claim 1 further includes a feed-forward circuit in parallel with the amplifier, wherein the feed-forward circuit compensates for transmission characteristics of the transmission line, (e.g., FIG. 4 ref #270, paragraph [0027]). The feed forward circuit of claim 1 comprises a plurality of switched capacitors in parallel with each other, wherein each one of the switched capacitors includes a capacitor in series with a switch and at least one of the plurality of switched capacitors is selectable based on a desired capacitance value to be placed in parallel with the output impedance, (e.g., FIG. 13 ref #561-563, 631-633, paragraph [0037]; FIG. 14 ref #560, 564, 566, 631-633, paragraph [0038]).

The output interface of claim 1 further includes a feed-forward control module coupled to the feed-forward circuit to adaptively alter a property of the feed-forward circuit in response to at least one characteristic of the transmission line, (e.g., FIG. 12

ref #590, paragraph [0035], [0036]; FIG. 13 ref #590, paragraph [0037]; FIG. 14 ref #590, paragraph [0038]).

Independent Claim 10 at least sets forth a device that comprises a data processing module having an output, (e.g., FIG. 3 ref #120, 130, paragraph [0026]), and an amplifier, (e.g., FIG. 4 ref #250, paragraph [0027]; FIG. 5 ref #250, paragraph [0028]; FIG. 6 ref #250, paragraph [0029]), having an input continuously coupled to the output of the data processing module, and an output, (e.g., FIG. 4 ref #250, paragraph [0027]; FIG. 6 ref #250, paragraph [0029]).

Claim 10 further comprises a feed-forward circuit having an input coupled to the output of the data processing module and an output coupled to the output of the amplifier, (e.g., FIG. 4 ref #270, paragraph [0027]), and a feed-forward control module coupled to the feed-forward circuit to adaptively select a capacitance value of the feed-forward circuit based on at least one characteristic of a transmission medium to which the device is electrically coupled, (e.g., FIG. 12 ref #590, paragraph [0035], [0036]; FIG. 13 ref #590, paragraph [0037]; FIG. 14 ref #590, paragraph [0038]). The feed-forward circuit of claim 10 further comprises a plurality of switched capacitors in parallel with each other, wherein each one of the switched capacitors includes a capacitor in series with a switch and at least one switched capacitor of the plurality of switched capacitors is selectable based on a desired capacitance value to be placed in parallel with said amplifier, (e.g., FIG. 13 ref #631-633, 561-563, paragraph [0037]; FIG. 14 ref #631-633, 560, 564, 566, paragraph [0038]).

Independent claim 18 is directed to a device comprising a printed circuit board, (e.g., FIG. 3 ref #110, paragraph [0026]), a first device having an input, (e.g., FIG. 3 ref #130, paragraph [0026]), a second device having an output, (e.g., FIG. 3 ref #120, paragraph [0026]), and an amplifier having an input and an output, (e.g., FIG. 4 ref #250, paragraph [0027]; FIG. 6 ref #250, paragraph [0029]). The input of the amplifier is continuously coupled to an output of the second device and the output of the amplifier is coupled to the input of the first device via the printed circuit board, (e.g., FIG. 3 ref #110, 140, paragraph [0025], [0026]).

The device of claim 18 further comprises a feed-forward circuit in parallel with the amplifier, (e.g., FIG. 4 ref #270, paragraph [0027]), and a feed-forward control

module coupled to the feed-forward circuit to adaptively select a capacitance value of the feed-forward circuit in response to at least one characteristic of the printed circuit board to which the first device is electrically coupled, (e.g., FIG. 12 ref #590, paragraph [0035], [0036]; FIG. 13 ref #590, paragraph [0037]; FIG. 14 ref # 590, paragraph [0038]). The feed-forward circuit comprises a plurality of switched capacitors in parallel with each other, wherein each one of the switched capacitors includes a capacitor in series with a switch and at least one switched capacitor of the plurality of switched capacitors is selectable based on a desired capacitance value to be placed in parallel with an output impedance of the amplifier, (e.g., FIG. 13 ref #631-633, 561-563, paragraph [0037]; FIG. 14 ref #631-633, 560, 564, 566, paragraph [0038]).

As required by 37 C.F.R. § 41.37(c)(1)(v), a concise explanation of the subject matter defined in each of the independent claims involved in the appeal is provided herein. Appellant notes that representative subject matter is identified for each of these claims; however, the abundance of supporting subject matter in the application prohibits identifying all textual and diagrammatic references to each claimed recitation. Appellant thus submits that other application subject matter, which supports the claims but is not specifically identified above, may be found elsewhere in the application. Appellant further notes that this summary does not provide an exhaustive or exclusive view of the present subject matter, and Appellant refers to the appended claims and their legal equivalents for a complete statement of the invention.

VI. GROUND OF REJECTION TO BE REVIEWED ON APPEAL

- A. Whether Claims 1-3 and 10-12 are anticipated under 35 U.S.C. §102(b) by U.S. Patent No. 4,686,686 to Nakayama et al (hereinafter "Nakayama").
- B. Whether Claims 4-5 and 13-14 are unpatentable under 35 U.S.C. §103(a) over Nakayama in view of U.S. Patent No. 3,886,470 to O'Neil et al (hereinafter "O'Neil").
- C. Whether Claim 9 is unpatentable under 35 U.S.C. §103(a) over Nakayama in view of U.S. Patent No. 5,493,246 to Anderson.
- D. Whether Claims 18-20 are unpatentable under 35 U.S.C. §103(a) over Nakayama in view of U.S. Patent No. 3,939,437 to Adam.
- E. Whether Claims 21-22 are unpatentable under 35 U.S.C. §103(a) over Nakayama in view of Adam and further in view of O'Neil.

VII. ARGUMENT

A. The Rejection Under 35 U.S.C. §102(b) Of Claims 1-3 And 10-12 Is Improper Because Nakayama Fails To Teach Each Of The Claimed Limitations

Independent Claims 1 and 10 include limitations directed to feed-forward apparatus that compensate for transmission medium distortion. Appellant maintains that Nakayama fails to teach the limitations of these claims, and accordingly the rejection of Claims 1 and 10 includes errors of fact, which has led to a rejection that is grounded in an error of law. The Appellant respectfully submits that the resulting errors of law compels reversal of these rejections.

As stated by M.P.E.P. §2131, To anticipate a claim, the reference must teach every element of the claim. "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987) ... The identical invention must be shown in as complete detail as is contained in the ... claim. *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989)". Therefore, all claim recitations and limitations, must be found in the prior art reference to maintain a rejection based on 35 U.S.C. §102. Appellant respectfully submits that Nakayama does not teach every element of independent Claims 1 and 10 and therefore fails to anticipate Claims 1 and 10.

Nakayama is directed to a switched capacitor circuit that samples the input signal via a clock signal whose frequency is varied by a clock signal controller in consideration of the data rate of the input signal. As will be described more fully below, however, the amplifier of Nakayama's equalizer circuit does not continuously receive an input signal, but rather discontinuously receives the input signal as required to sample the input signal. Thus, the described Nakayama circuit does not teach what is set forth in the claims as rejected by Nakayama.

In particular, Nakayama does not teach that amplifier 30 has an input that is continuously coupled to receive an input signal. Rather, Nakayama instead requires that amplifier 30 be discontinuously coupled to receive an input signal so that the input

signal may be sampled in a known manner. As stated in Nakayama, col. 2 line 65 to col. 3 line 8:

The illustrated capacitor circuit comprises a first set of first through third switches 16, 17, and 18 and a second set of fourth through sixth switches 19, 20, and 21. The first through third switches 16 to 18 are opened and closed in response to the first clock pulse succession ϕ_1 while the fourth through sixth switches 19 to 21 are operated in response to the second clock pulse succession ϕ_2 . Thus, the first-set switches 16 to 18 and the second-set switches 19 to 21 are alternately opened and closed. The first-set and the second-set switches 16 to 21 serve to sample the input signal IN in a known manner. (emphasis added)

Nakayama's amplifier 30 receives the input signal from switch 20 (FIG. 2, col. 3 lines 24-26), which requires that the input to amplifier 30 is coupled to receive an input signal while switch 20 is closed, but also requires that the input to amplifier 30 is not coupled to receive an input signal while switch 20 is open, i.e., Nakayama's amplifier 30 is not continuously coupled to receive an input signal because the input signal must be sampled in a known manner by alternately opening and closing switches 16-21. Thus, switch 20 must necessarily cause Nakayama's amplifier 30 to discontinuously receive an input signal. Referring to Claim 1, however, the claim requires that the amplifier have an input that is continuously coupled to receive an input signal. Such a limitation is in direct contradistinction to the teachings of Nakayama. Thus, Nakayama does not teach each of the claimed limitations of Claim 1 and, therefore, cannot be used to reject Claim 1 under 35 U.S.C. § 102(b).

Independent Claim 10 also stands rejected as being anticipated by Nakayama. Independent Claim 10, however, includes variants of an amplifier having an input that is continuously coupled to the output of another device. As described above, however, Nakayama does not teach these limitations. Further, the Appellant does not acquiesce that other claimed features of independent Claim 10 are in fact taught by Nakayama, but at least the foregoing reasons establish that Claim 10 is not anticipated by Nakayama.

Reversal of the rejection of Claims 1 and 10 is, therefore, respectfully solicited.

Dependent Claims 2-3 are dependent from independent Claim 1 and dependent Claims 11-12 are dependent from independent Claim 10. Each of these dependent

claims stands rejected as being anticipated by Nakayama. The Appellant respectfully disagrees. While Appellant does not acquiesce with particular rejections to these dependent claims, it is believed that these rejections are moot in view of the remarks made in connection with independent Claims 1 and 10. These dependent claims include all of the limitations of their respective base claim and any intervening claims, and recite additional features which further distinguish these claims from the cited reference. Therefore, dependent Claims 2-3 and 11-12 are also in condition for allowance over the Nakayama reference.

Reversal of the rejection of Claims 2-3 and 11-12 is, therefore, respectfully solicited.

Further errors of fact have occurred as a result of the Examiner's interpretation of Claims 1 and 10 that are inconsistent with the Specification. The Appellant respectfully submits that the resulting errors of law further compel reversal of these rejections. During examination, an Examiner is entitled to give the broadest reasonable interpretation of the claims (M.P.E.P. §2111). This interpretation must be, among other things, reasonable, consistent with the specification, and recognizable as the meaning to a person of ordinary skill in the art in question at the time of the invention. (M.P.E.P. §§ 2111, 2111.01). In the present case, however, the Appellant respectfully submits that it is not reasonable or consistent with the Specification to allow the Examiner to select attributes of a first claimed element and then use the selected attributes to interpret the attributes of a second claimed element during the course of a stated rejection.

In the Final Office Action dated June 1, 2007, for example, the Examiner provides a section entitled "Response to Arguments" (see Final Office Action, page 2). In this section, the Examiner argues that since the instant application discloses one embodiment of feed-forward circuit 270, e.g., FIG. 14, as including amplifier 580 that has an input that is coupled to switch 633, then the amplifier as recited in Claims 1 and 10 must also be interpreted as having an input that is controlled by a switch. In so doing, however, the Examiner applies attributes of the feed-forward circuit of Claims 1 and 10 to the attributes of the amplifier of Claims 1 and 10 that are inconsistent with the Specification. As Claims 1 and 10 clearly state, amplifier, e.g., 250, is coupled in

parallel with the feed forward circuit, e.g., 270, as exemplified in FIG. 4. Thus, switch 633 of feed-forward circuit 270 cannot control the input to the recited amplifier, e.g., 250, as the Examiner suggests. Instead, switch 633 of feed-forward circuit 270 only controls the input to the amplifier, e.g., 580 of FIG. 14, contained within feed-forward circuit 270, which cannot be the same amplifier that is recited in Claims 1 and 10 because the amplifier and the feed-forward circuit of Claims 1 and 10 are separately recited elements. Reversal of the rejection of Claims 1 and 10 is, therefore, respectfully solicited in light of further errors of law resulting from the Examiner's interpretation of Claims 1 and 10 that is inconsistent with the Specification.

Further errors of law have occurred as a result of the Examiner's use of Appellant's own disclosure as prior art against Claims 1 and 10. The Appellant respectfully submits that these errors of law compel reversal of the rejection of Claims 1 and 10. Using the work of the same inventive entity as prior art against the Claims is in violation of M.P.E.P. §2129 I., which states "the work of the same inventive entity may not be considered prior art against the claims unless it falls under one of the statutory categories."

On page 2 of the Advisory Action dated August 22, 2007, the Examiner cites M.P.E.P. § 2173.02 as authority to read Claim 1 in light of the specification for clarity and appropriate interpretation of Claim 1. In particular, the Examiner reads the limitations of the recited amplifier of Claims 1 and 10 as being consistent with the exemplary embodiment illustrated in FIG. 14. FIG. 14, however, exemplifies one embodiment of the feed-forward circuit as recited in Claims 1 and 10, but does not exemplify any embodiments of the amplifier as is also recited in Claims 1 and 10. As such, the Examiner incorrectly reads the specification and, thereby, misconstrues Claim 1 in light of the specification, which is an improper application of M.P.E.P. § 2173.02.

In particular, M.P.E.P. § 2173.02 states "[i]f the language of the claim is such that a person of ordinary skill in the art could not interpret the metes and bounds of the claim so as to understand how to avoid infringement, a rejection of the claim under 35 U.S.C. § 112, second paragraph, would be appropriate." (emphasis added) The Examiner, however, rejects Claim 1 under 35 U.S.C. § 102(b) by applying M.P.E.P. §

2173.02. In so doing, the Examiner confuses separate statutory grounds of rejection by justifying a rejection under 35 U.S.C. § 102(b) through an indirect use of 35 U.S.C. § 112, second paragraph, via M.P.E.P. § 2173.02. To uphold such a rejection, however, would be to allow the Examiner to effectively reject claims of the instant application as being anticipated by the Appellant's own disclosure, which as discussed above, is in violation of M.P.E.P. §2129 I. Since none of the exemplary embodiments contained within Appellant's disclosure have been shown to be prior art under any statutory categories, none of the embodiments exemplified in Appellant's disclosure may be used in an anticipatory rejection against Claims 1 and 10.

For all of the reasons stated above, reversal of the rejection of Claims 1 and 10 is, therefore, respectfully solicited.

B. The Rejection Under 35 U.S.C. §103(a) Of Claims 4-5 And 13-14 Is Improper At Least Because The Asserted Nakayama Reference, Even If Modified By O'Neil As Suggested By The Examiner, Fails To Teach Or Suggest Each Of The Claimed Limitations

In order to establish *prima facie* obviousness and maintain an obviousness rejection under 35 U.S.C. §103, the combination of the Nakayama and O'Neil references must teach or suggest all of the features of these rejected claims. (M.P.E.P. § 2143.03). The Appellant respectfully submits that the combination of Nakayama and O'Neil does not teach or suggest all the features of Claims 4-5 and 13-14, and these claims are not rendered obvious by the combination of Nakayama and O'Neil. The Appellant submits that the Examiner's rejection of these claims thus includes errors of fact, which has led to a rejection that is grounded in an error of law. The Appellant respectfully submits that the resulting error of law compels reversal of these rejections, as *prima facie* obviousness is not established with respect to Claims 4-5 and 13-14.

1. Dependent Claims 4 and 13

The Examiner admits that dependent Claims 4 and 13 set forth limitations of the feed-forward circuit as recited in Claims 1 and 10 that are not taught by Nakayama. (See page 6 of the Final Office Action dated June 1, 2007). For example, Claims 4 and 13 set forth that the feed-forward circuit, which is coupled in parallel with the recited amplifier of Claims 1 and 10, comprises a series combination of an amplifier and a capacitor. According to the Examiner, a correspondence exists between amplifier 12 and capacitor 56 of O'Neil and the recited amplifier and capacitor of Claims 4 and 13. The Examiner also proposes a correspondence between capacitors 36-39 and switches SW21-SW24 of Nakayama and the recited feed-forward circuit as recited in Claims 1 and 10. (See page 3 of the Final Office Action dated June 1, 2007). Thus, the Examiner proposes to modify Nakayama by replacing one of capacitors 36-39 and associated switches SW21-SW24 of Nakayama with the series combination of amplifier 12 and capacitor 56 of O'Neil.

The series combination of O'Neil's amplifier 12 and capacitor 56, however, is not coupled in parallel with Nakayama's amplifier 30 after the proposed modification, as is required by the feed-forward circuit of Claims 4 and 13. Instead, only O'Neil's capacitor 56 is coupled in parallel with amplifier 30. O'Neil's amplifier 12, on the other hand, is coupled in series with the parallel combination of capacitor 56 and amplifier 30, such that O'Neil's amplifier 12 "supplies approximately 1/10 of the signal power to a main component amplifier 14 and approximately 9/10 of the signal through a time delay circuit 16," which is also in series with capacitor 56. (See FIG. 2 and col. 3 lines 14-17). To modify Nakayama with O'Neil per the Examiner's proposal, therefore, requires that O'Neil's amplifier 12 is to be placed in series with Nakayama's amplifier 30 along the input path to amplifier 30, instead of being placed in parallel with Nakayama's amplifier 30. Since the series combination of amplifier 12 and capacitor 56 of O'Neil is not placed in parallel with Nakayama's amplifier 30, as required by Claims 4 and 13, the combination of Nakayama and O'Neil does not render Claims 4 and 13 *prima facie* obvious.

Reversal of the rejection of Claims 4 and 13 is, therefore, respectfully solicited.

2. Dependent Claims 5 and 14

The Examiner admits that dependent Claims 5 and 14 set forth limitations of the feed-forward circuit as recited in Claims 1 and 10 that are not taught by Nakayama. (See page 6 of the Final Office Action dated June 1, 2007). For example, Claims 5 and 14 set forth that the feed-forward circuit, which is coupled in parallel with the recited amplifier of Claims 1 and 10, comprises a series combination of a resistive element and a capacitor. According to the Examiner, a correspondence exists between resistive element 52 and capacitor 56 of O'Neil and the recited resistive element and capacitor of Claims 5 and 14. The Examiner also proposes a correspondence between capacitors 36-39 and switches SW21-SW24 of Nakayama and the recited feed-forward circuit as recited in Claims 1 and 10. (See page 3 of the Final Office Action dated June 1, 2007). Thus, the Examiner proposes to modify Nakayama by replacing one of capacitors 36-39 and associated switches SW21-SW24 of Nakayama with the series combination of resistive element 52 and capacitor 56 of O'Neil.

The series combination of O'Neil's resistive element 52 and capacitor 56, however, is not coupled in parallel with Nakayama's amplifier 30 after the proposed modification, as is required by the feed-forward circuit of Claims 5 and 14. Instead, only O'Neil's capacitor 56 is coupled in parallel with amplifier 30. O'Neil's resistive element 52, on the other hand, is coupled in series with the parallel combination of capacitor 56 and amplifier 14, such that "[a]uxiliary amplifier 22 is preceded by variable gain control 52," which is also in series with capacitor 56. (See FIG. 2 and col. 5 lines 20-21). To modify Nakayama with O'Neil per the Examiner's proposal, therefore, requires that O'Neil's resistive element 52 is to be placed in series with Nakayama's amplifier 30 along the output path of amplifier 30, instead of being placed in parallel with Nakayama's amplifier 30. Since the series combination of resistive element 52 and capacitor 56 of O'Neil is not placed in parallel with Nakayama's amplifier 30, as required by Claims 5 and 14, the combination of Nakayama and O'Neil does not render Claims 5 and 14 *prima facie* obvious.

Reversal of the rejection of Claims 5 and 14 is, therefore, respectfully solicited.

C. The Rejection Of Dependent Claim 9 Under 35 U.S.C. §103(a) Is Improper At Least Because The Asserted Nakayama Reference, Even If Modified By Anderson As Suggested By The Examiner, Fails To Teach Or Suggest Each Of The Claimed Limitations

In order to establish *prima facie* obviousness and maintain an obviousness rejection under 35 U.S.C. §103, the combination of the Nakayama and Anderson references must teach or suggest all of the features of this rejected claim. (M.P.E.P. § 2143.03). The Appellant respectfully submits that the combination of Nakayama and Anderson does not teach or suggest all the features of Claim 9, and this claim is not rendered obvious by the combination of Nakayama and Anderson. The Appellant submits that the Examiner's rejection of this claim thus includes errors of fact, which has led to a rejection that is grounded in an error of law. The Appellant respectfully submits that the resulting error of law compels reversal of this rejection, as *prima facie* obviousness is not established with respect to Claim 9.

The Examiner admits that dependent Claim 9 sets forth limitations of the feed-forward circuit as recited in Claim 1 that are not taught by Nakayama. (See page 7 of the Final Office Action dated June 1, 2007). For example, Claim 9 at least sets forth that the feed-forward circuit adaptively alters a property of the feed-forward circuit that includes a resistive and a capacitive property. Accordingly, the Examiner combines Anderson with Nakayama to remedy the deficiencies of Nakayama with respect to Claim 9. In particular, the Examiner suggests that Anderson teaches capacitive and resistive properties of a feed-forward circuit. Furthermore, the Examiner suggests that impedance blocks 12, 18, 22, and 24 correspond to the feed-forward circuit of Claim 1 as further limited by Claim 9. (See page 7 of the Final Office Action dated June 1, 2007).

The Examiner, however, fails to show how Anderson adaptively alters the purported capacitive and resistive properties of impedance blocks 12, 18, 22, and 24 as required by Claims 1 and 9. Rather, Anderson requires manual control of the purported capacitive and resistive properties of impedance blocks 12, 18, 22, and 24, as verified in col. 5 lines 22-26:

Field programmable analog arrays provide flexibility in design where the user may program the setting of switching circuits in the impedance blocks to effect the appropriate impedance in the feed-forward and the feed-back paths to configure the amplifier according to the desired function. (emphasis added)

Similar teachings may be found at col. 2 lines 10-15 of Anderson. Thus, Anderson's control of impedance blocks 12, 18, 22, and 24 is non-adaptive, which is in contradistinction to Claim 1 as further limited by Claim 9.

In addition, it has been shown that Nakayama does not teach that amplifier 30 has an input that is continuously coupled to receive an input signal. Rather, Nakayama instead requires that amplifier 30 be discontinuously coupled to receive an input signal so that the input signal may be sampled in a known manner. (See col. 2 line 65 to col. 3 line 8). Such a teaching, however, is in contradistinction to Claim 1.

For all of the reasons given above, reversal of the rejection of Claim 9 is respectfully solicited.

D. The Rejection Of Claims 18-20 Under 35 U.S.C. §103(a) Is Improper Because The Proposed Modification Of Nakayama With Adam Changes The Principle Of Operation Of Nakayama

In order to establish *prima facie* obviousness and maintain an obviousness rejection under 35 U.S.C. §103, modification of Nakayama with Adam must not change the principle of operation of Nakayama. "If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious." M.P.E.P. §2143.01 VI. The Appellant respectfully submits, however, that the modification of Nakayama with Adam does change the principle of operation of Nakayama and, therefore, Claims 18-20 are not rendered obvious by the modification of Nakayama with Adam. The Appellant submits that the Examiner's rejection of these claims thus includes errors of fact, which has led to a rejection that is grounded in an error of law. The Appellant respectfully submits that the resulting error of law compels reversal of these rejections, as *prima facie* obviousness is not established with respect to Claims 18-20.

The Examiner admits that Claim 18 sets forth limitations that are not taught by Nakayama. (See pages 7-8 of the Final Office Action dated June 1, 2007). For example, Claim 18 at least sets forth a printed circuit board, a first device having an input, a second device having an output, and an amplifier having an input and an output, wherein the input of the amplifier is continuously coupled to an output of the second device and the output of the amplifier is coupled to the input of the first device via the printed circuit board.

Accordingly, the Examiner proposes to modify Nakayama with Adam to remedy the deficiencies of Nakayama with respect to Claim 18. In particular, the Examiner proposes to replace Nakayama's amplifier 30 with Adam's amplifier 18. Furthermore, the Examiner proposes to replace Nakayama's switch 20 with Adam's delay line 16, since Adam's delay line 16 is coupled to the input of Adam's amplifier 18. (See page 8 of the Final Office Action dated June 1, 2007). However, the proposed modification changes the principle of operation of Nakayama because the Examiner proposes to remove Nakayama's switch 20 in favor of Adam's delay line 16. Switch 20, however, is required by Nakayama "to sample the input signal IN in a known manner." (See col. 3 lines 6-8). Since the Examiner's proposed modification of Nakayama with Adam changes the principle of operation of Nakayama, the combination of Nakayama with Adam does not render Claim 18 *prima facie* obvious.

Dependent Claims 19-20 are dependent from independent Claim 18. Each of these dependent claims stands rejected as being unpatentable over the combination of Nakayama and Adam. The Appellant respectfully disagrees. While Appellant does not acquiesce with particular rejections to these dependent claims, it is believed that these rejections are moot in view of the remarks made in connection with independent Claim 18. These dependent claims include all of the limitations of their respective base claim and any intervening claims, and recite additional features which further distinguish these claims from the cited reference. Therefore, dependent Claims 19-20 are also in condition for allowance over the combination of Nakayama and Adam.

Reversal of the rejections of Claims 18-20 is, therefore, respectfully solicited.

E. The Rejection Of Claims 21-22 Under 35 U.S.C. §103(a) Is Improper Because The Combination Of Nakayama And Adam Changes The Principle Of Operation Of Nakayama And Because The Combination Of Nakayama, Adam, And O'Neil Fails To Teach Or Suggest Each Of The Claimed Limitations

In order to establish *prima facie* obviousness and maintain an obviousness rejection under 35 U.S.C. §103, the combination of Nakayama with Adam and O'Neil must not change the principle of operation of Nakayama. "If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious." M.P.E.P. §2143.01 VI. The Appellant respectfully submits, however, that the combination of Nakayama with Adam and O'Neil does change the principle of operation of Nakayama and, therefore, Claims 21-22 are not rendered obvious by the combination of Nakayama with Adam and O'Neil. The Appellant submits that the Examiner's rejection of these claims thus includes errors of fact, which has led to a rejection that is grounded in an error of law. The Appellant respectfully submits that the resulting error of law compels reversal of these rejections, as *prima facie* obviousness is not established with respect to Claims 21-22.

The Examiner admits that Claim 18 sets forth limitations that are not taught by Nakayama. (See pages 7-8 of the Final Office Action dated June 1, 2007). For example, Claim 18 at least sets forth a printed circuit board, a first device having an input, a second device having an output, and an amplifier having an input and an output, wherein the input of the amplifier is continuously coupled to an output of the second device and the output of the amplifier is coupled to the input of the first device via the printed circuit board.

Accordingly, the Examiner proposes to modify Nakayama with Adam to remedy the deficiencies of Nakayama with respect to Claim 18. In particular, the Examiner proposes to replace Nakayama's amplifier 30 with Adam's amplifier 18. Furthermore, the Examiner proposes to replace Nakayama's switch 20 with Adam's delay line 16, since Adam's delay line 16 is coupled to the input of Adam's amplifier 18. (See page 8 of the Final Office Action dated June 1, 2007). However, the proposed modification changes the principle of operation of Nakayama because the Examiner proposes to remove Nakayama's switch 20 in favor of Adam's delay line 16, where Nakayama's

switch 20 is required "to sample the input signal IN in a known manner." (See col. 3 lines 6-8).

1. Dependent Claim 21

The Examiner further admits that dependent Claim 21 sets forth limitations of the feed-forward circuit as recited in Claim 18 that are not taught by the combination of Nakayama and Adam. (See page 9 of the Final Office Action dated June 1, 2007). For example, Claim 21 sets forth that the feed-forward circuit, which is coupled in parallel with the recited amplifier of Claim 18, comprises a series combination of an amplifier and a capacitor. According to the Examiner, a correspondence exists between amplifier 12 and capacitor 56 of O'Neil and the recited amplifier and capacitor of Claim 21. The Examiner also proposes a correspondence between capacitors 36-39 and switches SW21-SW24 of Nakayama and the recited feed-forward circuit as recited in Claim 18. (See page 3 of the final Office Action dated June 1, 2007). Thus, the Examiner proposes to modify the combination of Nakayama and Adam as applied to Claim 18 by replacing one of capacitors 36-39 and associated switches SW21-SW24 of Nakayama with the series combination of amplifier 12 and capacitor 56 of O'Neil.

The series combination of O'Neil's amplifier 12 and capacitor 56, however, is not coupled in parallel with Nakayama's amplifier 30 after the proposed modification, as is required by the feed-forward circuit of Claim 18. Instead, only O'Neil's capacitor 56 is coupled in parallel with amplifier 30. O'Neil's amplifier 12, on the other hand, is coupled in series with the parallel combination of capacitor 56 and amplifier 30, such that O'Neil's amplifier 12 "supplies approximately 1/10 of the signal power to a main component amplifier 14 and approximately 9/10 of the signal through a time delay circuit 16," which is also in series with capacitor 56. (See FIG. 2 and col. 3 lines 14-17 of O'Neil). To modify the combination of Nakayama and Adam with O'Neil per the Examiner's proposal, therefore, requires that O'Neil's amplifier 12 is to be placed in series with Nakayama's amplifier 30 along the input path to amplifier 30, instead of being placed in parallel with Nakayama's amplifier 30. Since the series combination of

amplifier 12 and capacitor 56 of O'Neil is not placed in parallel with Nakayama's amplifier 30, the combination of Nakayama, Adam, and O'Neil does not render Claim 21 *prima facie* obvious.

For all of the reasons stated above, the reversal of the rejection of Claim 21 is respectfully solicited.

2. Dependent Claim 22

The Examiner further admits that dependent Claim 22 sets forth limitations of the feed-forward circuit as recited in Claim 18 that are not taught by the combination of Nakayama and Adam. (See page 9 of the Final Office Action dated June 1, 2007). For example, Claim 22 sets forth that the feed-forward circuit, which is coupled in parallel with the recited amplifier of Claim 18, comprises a series combination of a resistive element and a capacitor. According to the Examiner, a correspondence exists between resistive element 52 and capacitor 56 of O'Neil and the recited resistive element and capacitor of Claim 22. The Examiner also proposes a correspondence between capacitors 36-39 and switches SW21-SW24 of Nakayama and the recited feed-forward circuit as recited in Claim 18. (See page 3 of the final Office Action dated June 1, 2007). Thus, the Examiner proposes to modify the combination of Nakayama and Adam by replacing one of capacitors 36-39 and associated switches SW21-SW24 of Nakayama with the series combination of resistive element 52 and capacitor 56 of O'Neil.

The series combination of O'Neil's resistive element 52 and capacitor 56, however, is not coupled in parallel with Nakayama's amplifier 30 after the proposed modification, as is required by the feed-forward circuit of Claim 18. Instead, only O'Neil's capacitor 56 is coupled in parallel with amplifier 30. O'Neil's resistive element 52, on the other hand, is coupled in series with the parallel combination of capacitor 56 and amplifier 14, such that "[a]uxiliary amplifier 22 is preceded by variable gain control 52," which is also in series with capacitor 56. (See FIG. 2 and col. 5 lines 20-21). To modify the combination of Nakayama and Adam with O'Neil per the Examiner's proposal, therefore, requires that O'Neil's resistive element 52 is to be placed in series


with Nakayama's amplifier 30 along the output path of amplifier 30, instead of being placed in parallel with Nakayama's amplifier 30. Since the series combination of resistive element 52 and capacitor 56 of O'Neil is not placed in parallel with Nakayama's amplifier 30, as required by Claim 22, the combination of Nakayama, Adam, and O'Neil does not render Claim 22 *prima facie* obvious.

For all of the reasons stated above, the reversal of the rejection of Claim 22 is respectfully solicited.

VIII. CONCLUSION

In view of the above, Appellant respectfully submits that the claimed invention is patentable over the cited references and that the rejections of Claims 1-66 and 69-74 should be reversed. Appellant respectfully requests reversal of the rejections as applied to the appealed claims and allowance of the entire application.

Respectfully submitted,



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I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450, on November 8, 2007.

Julie Matthews
Name


Signature

IX. CLAIMS APPENDIX

1. An output interface comprising:
an amplifier having an output impedance and an input continuously coupled to receive an input signal, wherein the amplifier sources a transmission line;
a feed-forward circuit in parallel with the amplifier, wherein the feed-forward circuit compensates for transmission characteristics of the transmission line;
a feed-forward control module coupled to the feed-forward circuit to adaptively alter a property of the feed-forward circuit in response to at least one characteristic of the transmission line; and
wherein the feed-forward circuit further comprises a plurality of switched capacitors in parallel with each other, wherein each one of the switched capacitors includes a capacitor in series with a switch and at least one of the plurality of switched capacitors is selectable based on a desired capacitance value to be placed in parallel with the output impedance.
2. The output interface as in claim 1, wherein a capacitance value of a capacitor of said plurality of switched capacitors is determined at least in part by a data transition rate.
3. The output interface as in claim 1, wherein a capacitance value of a capacitor of said plurality of switched capacitors is determined based at least in part on a characteristic of said transmission line to which said output interface is electrically coupled.
4. The output interface as in claim 1, wherein said feed-forward circuit further comprises an amplifier in series with a capacitor.
5. The output interface as in claim 1, wherein said feed-forward circuit further comprises a resistive element in series with a capacitor.

9. The output interface as in claim 1, wherein the property is one of a capacitance value and a resistance value.

10. A device comprising:
a data processing module having an output;
an amplifier having an input continuously coupled to the output of the data processing module, and an output;
a feed-forward circuit having an input coupled to the output of the data processing module and an output coupled to the output of the amplifier;
a feed-forward control module coupled to the feed-forward circuit to adaptively select a capacitance value of the feed-forward circuit based on at least one characteristic of a transmission medium to which the device is electrically coupled; and
wherein said feed-forward circuit further comprises a plurality of switched capacitors in parallel with each other, wherein each one of the switched capacitors includes a capacitor in series with a switch and at least one switched capacitor of the plurality of switched capacitors is selectable based on a desired capacitance value to be placed in parallel with said amplifier.

11. The device as in claim 10, wherein a capacitance value of a capacitor of said plurality of switched capacitors is determined at least in part by a data transition rate.

12. The device as in claim 10, wherein a capacitance value of a capacitor of said plurality of switched capacitors is determined based at least in part on a characteristic of a transmission medium to which said output interface is electrically coupled.

13. The device as in claim 10, wherein said feed-forward circuit further comprises an amplifier in series with a capacitor of said plurality of switched capacitors.

14. The device as in claim 10, wherein said feed-forward circuit further comprises a resistive element in series with a capacitor of said plurality of switched capacitors.

18. A device comprising:
a printed circuit board;
a first device having an input;
a second device having an output:
an amplifier having an input and an output, wherein the input of the amplifier is continuously coupled to an output of the second device and the output of the amplifier is coupled to the input of the first device via the printed circuit board;
a feed-forward circuit in parallel with the amplifier;
a feed-forward control module coupled to the feed-forward circuit to adaptively select a capacitance value of the feed-forward circuit in response to at least one characteristic of the printed circuit board to which the first device is electrically coupled; and
wherein the feed-forward circuit comprises a plurality of switched capacitors in parallel with each other, wherein each one of the switched capacitors includes a capacitor in series with a switch and at least one switched capacitor of the plurality of switched capacitors is selectable based on a desired capacitance value to be placed in parallel with an output impedance of the amplifier.

19. The device as in claim 18, wherein a capacitance value of a switched capacitor of the plurality of switched capacitors is determined at least in part by a data transition rate.

20. The device as in claim 18, wherein a capacitance value of a switched capacitor of the plurality of switched capacitors is determined based at least in part on a characteristic of the printed circuit board to which the first device is electrically coupled.

21. The device as in claim 18, wherein said feed-forward circuit further comprises an amplifier in series with a capacitor.

22. The device as in claim 18, wherein said feed-forward circuit further comprises a resistive element in series with a capacitor.

X. EVIDENCE APPENDIX

None.

XI. RELATED PROCEEDINGS APPENDIX

None.